

IN THE CLAIMS:

The claims are listed as follows:

1. (Currently Amended) A method for generating X-ray ~~or EUV~~ radiation, comprising the steps of:
 - (i) forming a target jet by urging a liquid substance under pressure through an outlet opening, the target jet propagating through an area of interaction, ~~and~~
 - (ii) directing at least one electron beam onto the target jet in the area of interaction such that the electron beam interacts with the target jet to generate X-ray ~~or EUV~~ radiation, and
 - (iii) controlling the electron beam to interact with the jet at an intensity such that Bremsstrahlung and characteristic line emission is generated in the X-ray region wherein the target jet is formed to have a sufficiently high propagation speed in the area of interaction in order for the emission to be generated essentially without heating the jet to a plasma-forming temperature, the propagation speed being at least 10 m/s in the area of interaction.
2. (Previously Presented) A method according to claim 1, wherein the substance comprises a solid material, heated to a liquid state.
3. (Previously Presented) A method according to claim 2, wherein the solid material is a metal.

4. (Previously Presented) A method according to claim 1, wherein the substance comprises a gas, cooled to a liquid state.

5. (Previously Presented) A method according to claim 4, wherein the gas is a noble gas.

6. (Previously Presented) A method according to claim 1, wherein the electron beam interacts with the jet at a distance from about 0.5 mm to about 10 mm from the outlet opening.

7-8. (Cancelled)

9. (Previously Presented) A method according to claim 1, wherein the target jet is in a solid state in the area of interaction.

10. (Previously Presented) A method according to claim 1, wherein the target jet is in a liquid state in the area of interaction.

11. (Previously Presented) A method according to claim 10, wherein the electron beam interacts with at least one droplet in the area of interaction.

12. (Previously Presented) A method according to claim 10, wherein the electron beam interacts with a spray of droplets or clusters in the area of interaction.

13. (Previously Presented) A method according to claim 1, wherein the electron beam interacts with a spatially continuous portion of the target jet in the area of interaction.

14. (Previously Presented) A method according to claim 1, wherein the electron beam is focused on the target jet to essentially match a transverse dimension of the electron beam to a transverse dimension of the jet.

15. (Previously Presented) A method according to claim 1, wherein the target jet is formed with a diameter from about 1 μm to about 10,000 μm .

16. (Previously Presented) A method according to claim 1, wherein the electron beam is generated by means of an acceleration voltage from about 5 kV to about 500 kV and an average beam current from about 10 mA to about 1000 mA.

17. (Previously Presented) A method according to claim 1, wherein at least one pulsed electron beam is directed onto the target jet.

18. (Previously Presented) A method according to claim 1, wherein at least one continuous electron beam is directed onto the target jet.

19. (Currently Amended) A method according to claim 1, further comprising the step of performing a medical ~~diagnosis~~ diagnostics with the X-ray or EUV radiation.

20. (Previously Presented) A method according to claim 1, further comprising the step of performing non-destructive analysis with the X-ray or EUV radiation.

21. (Previously Presented) A method according to claim 1, wherein EUV radiation is generated, and further comprising the step of performing EUV projection lithography with the EUV radiation.

22. (Previously Presented) A method according to claim 1, further comprising the step of performing crystal analysis with the X-ray or EUV radiation.

23. (Previously Presented) A method according to claim 1, further comprising the step of performing microscopy with the X-ray or EUV radiation.

24. (Currently Amended) A method according to claim 1, ~~wherein X-ray radiation is generated, and~~ further comprising the step of performing X-ray diffraction with the X-ray radiation.

25. (Previously Presented) A method according to claim 24, wherein the X-ray diffraction is performed for the purpose of protein structure determination.

26-27. (Cancelled)

28. (Currently Amended) An apparatus for generating X-ray ~~or EUV~~ radiation, comprising

a target generator arranged to form a target jet by urging a liquid substance through an outlet opening, the target jet propagating towards an area of interaction, ~~and~~

an electron source for providing at least one electron beam and directing the at least one electron beam onto the jet in the area of interaction, ~~said the~~ radiation being generated by the electron beam interacting with the jet, ~~and~~

wherein the electron source is controllable to effect interaction of the electron beam with the target jet at an intensity of the electron beam such that Braggstrahlung and characteristic line emission is generated in the X-ray region, essentially without heating the jet to a plasma-forming temperature, and wherein the target generator is operative to generate the target jet to have a sufficiently high propagation speed in the area of interaction

in order for the emission to be generated essentially without heating the jet to a plasma-forming temperature, the propagation speed being at least 10 m/s in the area of interaction.

29. (Previously Presented) An apparatus according to claim 28, wherein the substance comprises a solid, heated to a liquid state.

30. (Previously Presented) An apparatus according to claim 29, wherein the solid is a metal.

31. (Previously Presented) An apparatus according to claim 28, wherein the substance comprises a gas, cooled to a liquid state.

32. (Previously Presented) An apparatus according to claim 31, wherein the gas is a noble gas.

33. (Previously Presented) An apparatus according to claim 28, wherein the electron source is controllable to direct the electron beam onto the target jet at a distance from about 0.5 mm to about 10 mm from the outlet opening.

34-35. (Cancelled)

36. (Previously Presented) An apparatus according to claim 28, wherein the target generator is controllable to provide condensed matter in the area of interaction.

37. (Previously Presented) An apparatus according to claim 28, wherein the target generator is controllable to provide a spatially continuous portion of the jet, at least one droplet, or a spray of droplets or clusters in the area of interaction.

38. (Previously Presented) An apparatus according to claim 28, wherein the electron source is controllable to essentially match a transverse dimension of the electron beam to a transverse dimension of the jet by focusing the electron beam on the jet.

39. (Previously Presented) An apparatus according to claim 28, wherein the target generator is adapted to generate the jet with a diameter from about 1 μm to about 10,000 μm .

40. (Previously Presented) An apparatus according to claim 28, wherein the electron source is controllable to generate the electron beam by means of an acceleration voltage from about 5 kV to about 500 kV, and wherein the electron beam has an average beam current from about 10 mA to about 1000 mA.

41. (Previously Presented) An apparatus according to claim 28, wherein the electron source is controllable for generation of at least one pulsed electron beam.

42. (Previously Presented) An apparatus according to claim 28, wherein the electron source is controllable for generation of at least one continuous electron beam.

43-44. (Cancelled)

45. (New) A method according to claim 1, wherein the target jet is formed to have a propagation speed on the order of 10-1000 m/s in the area of interaction.

46. (New) A method according to claim 1, wherein the target jet is formed to have a propagation speed of about 600 m/s in the area of interaction.

47. (New) A method according to claim 16, wherein the target jet is formed to have a propagation speed on the order of 10-1000 m/s in the area of interaction.

48. (New) A method according to claim 16, wherein the target jet is formed to have a propagation speed of about 600 m/s in the area of interaction.

49. (New) An apparatus according to claim 28, wherein the target generator is operative to generate the target jet to have a propagation speed on the order of 10-1000 m/s in the area of interaction.

50. (New) An apparatus according to claim 28, wherein the target generator is operative to generate the target jet to have a propagation speed of about 600 m/s in the area of interaction.

51. (New) An apparatus according to claim 40, wherein the target generator is operative to generate the target jet to have a propagation speed on the order of 10-1000 m/s in the area of interaction.

52. (New) An apparatus according to claim 40, wherein the target generator is operative to generate the target jet to have a propagation speed of about 600 m/s in the area of interaction.